

**This product was developed by the
RWJ Diabetes Self Management
Program at Community Health Center,
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ADA CLINICAL PRACTICE RECOMMENDATIONS

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Criteria for the Diagnosis of Diabetes

1. Symptoms of diabetes (polyuria, polydipsia, unexplained weight loss) plus casual plasma glucose concentration ≥ 200 mg/dL (11.1 mmol/L). (Casual = any time of day without regard to time since last meal)

or
2. FPG ≥ 126 mg/dL (7.0 mmol/L). (Fasting = no caloric intake for at least 8 h)

or
3. 2h plasma glucose ≥ 200 mg/dL during an OGTT (75 g) performed as described by WHO

In the absence of unequivocal hyperglycemia with acute metabolic decompensation, these criteria should be confirmed by repeat testing on a different day. The OGTT is not recommended for routine clinical use.

Rationale for Glucose Control

- Prevent acute hyperglycemic complications (DKA, HNK)
- Relieve hyperglycemic symptoms
 - Polydipsia
 - Polyuria
 - Weight loss
 - Blurred vision
- Prevent long-term complications

Good Glycemic Control (Lower HbA_{1c}) Reduces Incidence of Complications

HbA _{1c}	<u>DCCT</u>	<u>Kumamoto</u>	<u>UKPDS</u>
	9 → 7%	9 → 7%	8 → 7%
Retinopathy	63%	69%	17-21%
Nephropathy	54%	70%	24-33%
Neuropathy	60%	—	—
Macrovascular disease	41%*	—	16%*

* not statistically significant

Diabetes Control and Complications Trial (DCCT) Research Group. *N Engl J Med.* 1993;329:977-986.
 Ohkubo Y et al. *Diabetes Res Clin Pract.* 1995;28:103-117.
 UK Prospective Diabetes Study Group (UKPDS) 33: *Lancet.* 1998;352:837-853.

Assessment of Glycemic Control

Self-Monitoring of Blood Glucose

- SMBG is an integral component of diabetes therapy
- Include SMBG in management plan
- Instruct patient in SMBG and routinely
- Evaluate the patient's technique and ability to use data to adjust therapy

Glycated Protein Testing

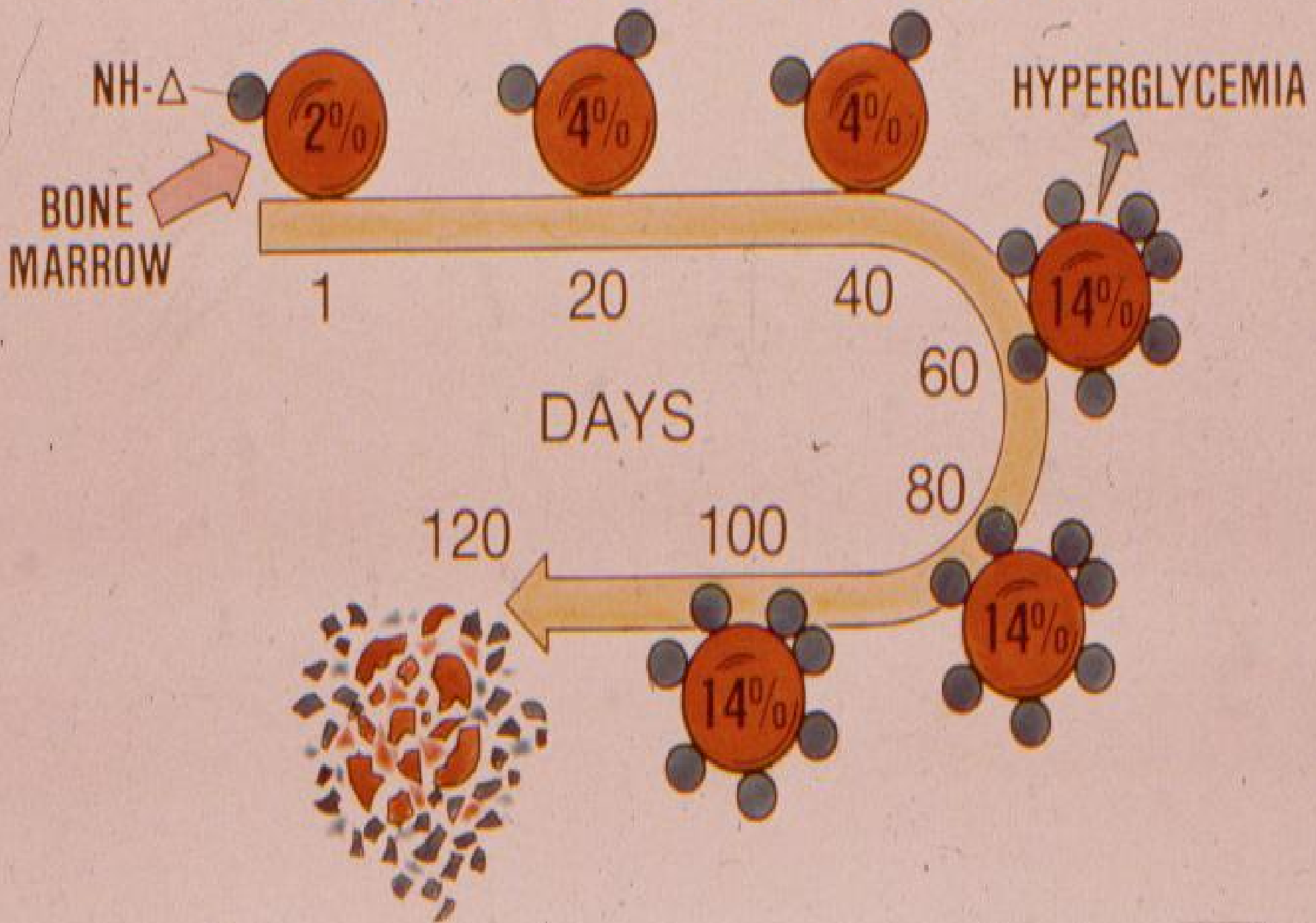
**Glycated Hemoglobin (HbA1c),
%= Mean glucose**

HbA1c %	MBG
5.0	81mg/d
5.1	84 “
5.2	87 “
5.3	90 “

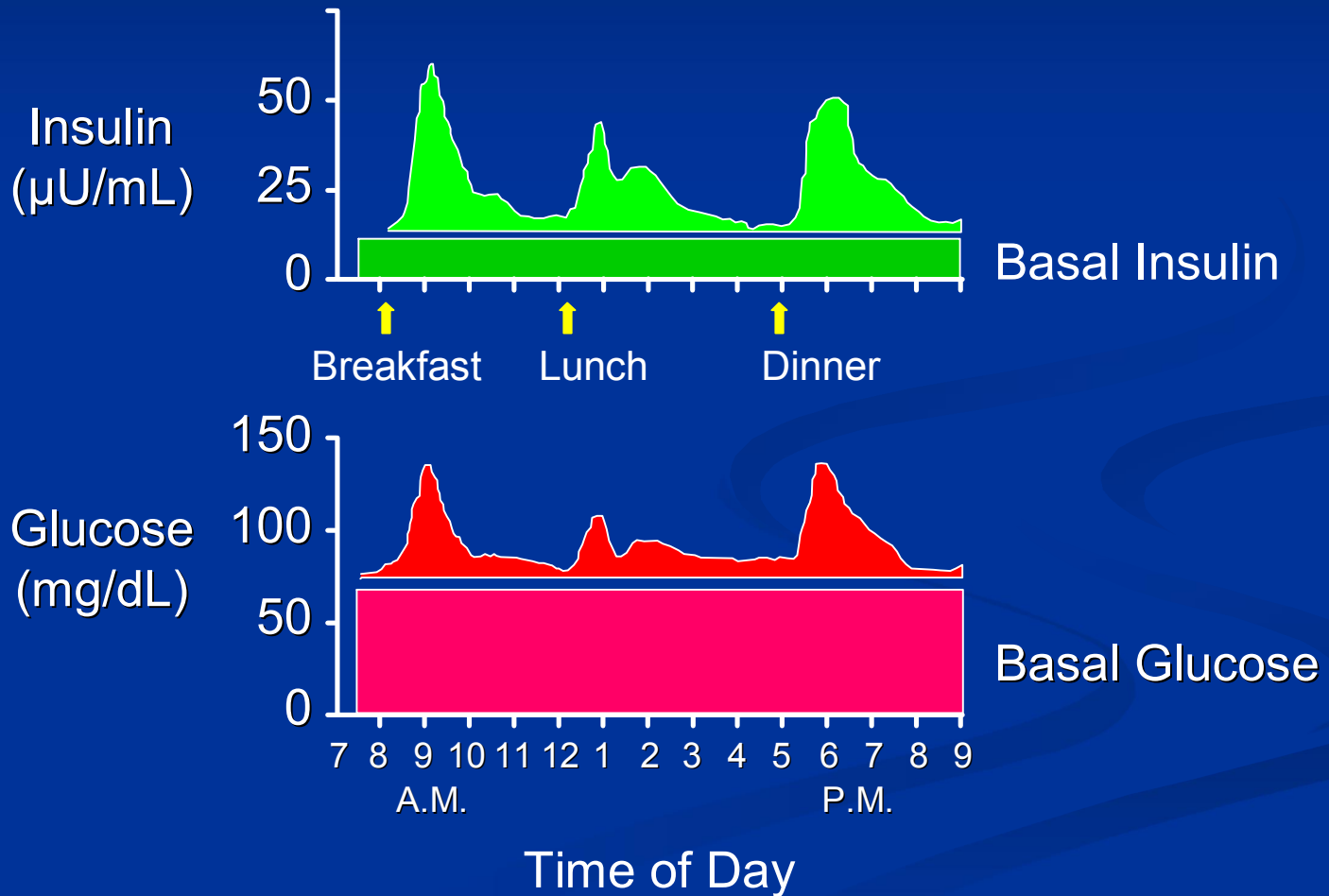
8.9	210 “

$$\text{MBG} = (\text{HbA1c} \times 33.3) - 86$$

GLYCOSYLATED HEMOGLOBIN



Physiologic Insulin Secretion 24-Hour Profile



Basal – Bolus Therapy

- Physiologic
- Attainment of goal HbA1c
- Potential reduction in cardiovascular morbidity with reduction in blood glucose excursion

Nutritional Goals

- Provide meal-planning advice
- Balance food intake with drug therapy and exercise
- Maintain reasonable weight by monitoring calorie consumption

Glycemic Control in Diabetes

<u>Biochemical Index</u>	<u>Normal</u>	<u>ADA Goal</u>	<u>AACE</u>
Preprandial glucose (mg/dL)*	<110	80–120	<110
Postprandial glucose		80-180	<140
Bedtime glucose (mg/dL)*	<120	100–140	
HbA _{1c} (%)	<6	<7	<6.5

*Measurement of capillary blood glucose.

American Diabetes Association Clinical Practice Recommendations, 1998.
Diabetes Care. 1999;22(suppl 1):S33.

Physical Activity



420 Cal./Hr.



900 Cal./Hr.



80 Cal./Hr.



2-600 Cal./Hr.



2-300 Cal./Hr.

Cardiovascular Disease: Risk Factor Management

- Blood pressure control
- Glucoregulation
- Lipid management
- Anti-platelet treatment
- Smoking cessation

Lipid and Blood Pressure Goals

Blood Pressure (mmHg)

Lipids (mg/dl)

Systolic <130

Cholesterol <200

Diastolic <80

LDL-C <100

HDL-C M>45 W>55

Triglycerides <150

The Metabolic Syndrome of Insulin Resistance



Patterns of Body Fat Distribution

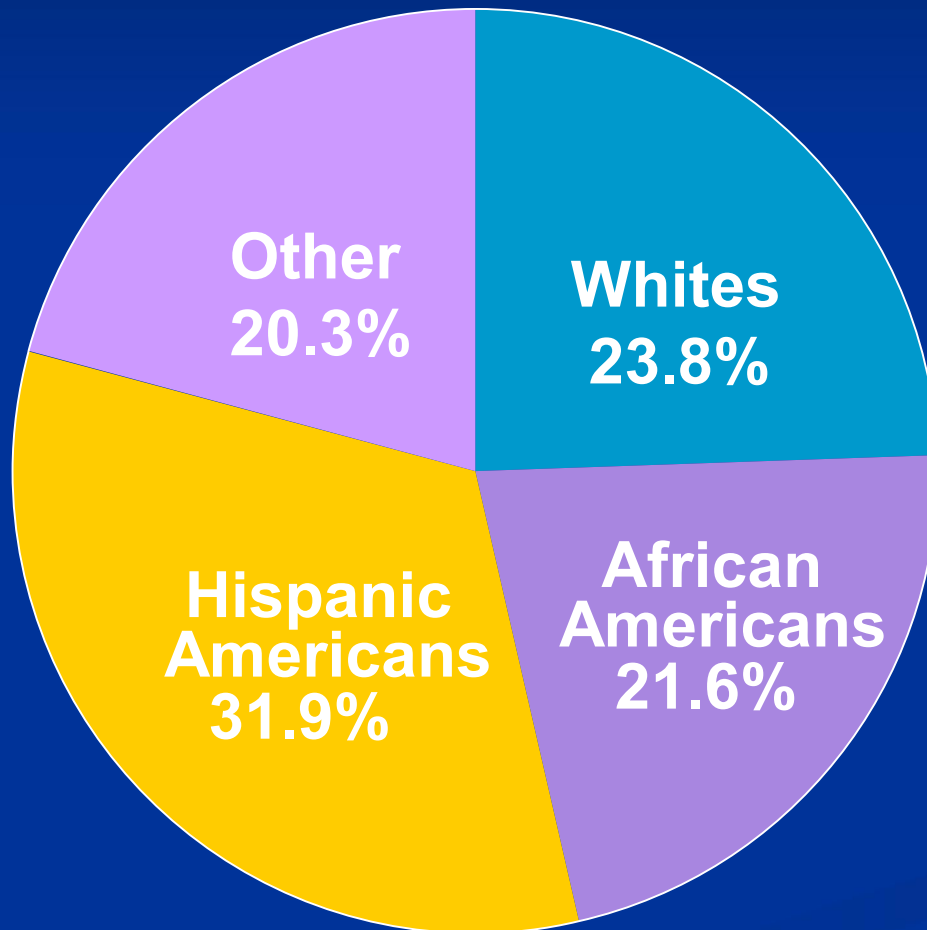
Abdominal
(android)



Lower body
(gynoid)



Age-Adjusted Prevalence of the Metabolic Syndrome by Race/Ethnicity Among US Adults



**Approximately
47 million US
adults have the
metabolic syndrome**

Working Definition of the Metabolic Syndrome

≥3 of the following:

Risk Factor	Defining Level
Abdominal obesity (waist circumference*)	
Men	>102 cm (>40 in)
Women	> 88 cm (>35 in)
Triglycerides	≥150 mg/dL
HDL cholesterol	
Men	<40 mg/dL
Women	<50 mg/dL
Blood pressure	≥130/≥85 mm Hg
Fasting glucose	≥110 mg/dL

Diabetic Nephropathy

Albuminuria:

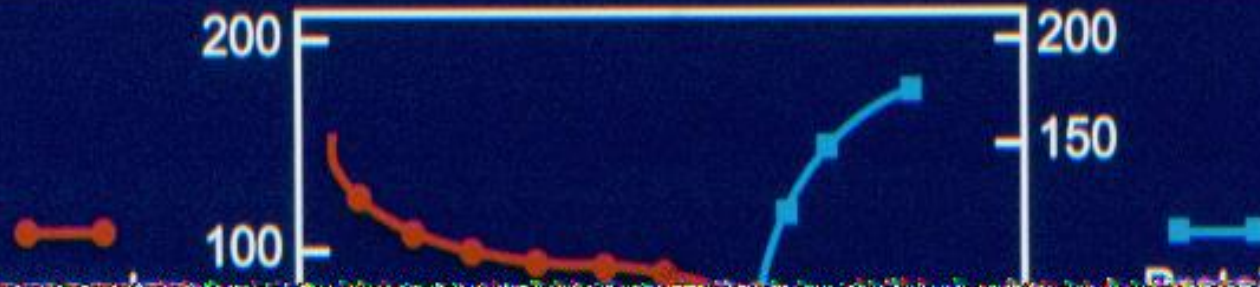
- Predictive of renal failure
- Marker of increased CV morbidity and mortality

Definitions of Albuminuria

Category	24h Collect. (mg/24h)	Timed Collect. (mcg/min)	Spot Collect. (mcg/mg creatinine)
Normal	<30	<20	<30
Microalbuminuria	30-299	20-199	30-299
Clinical albuminuria	>300	>200	>300

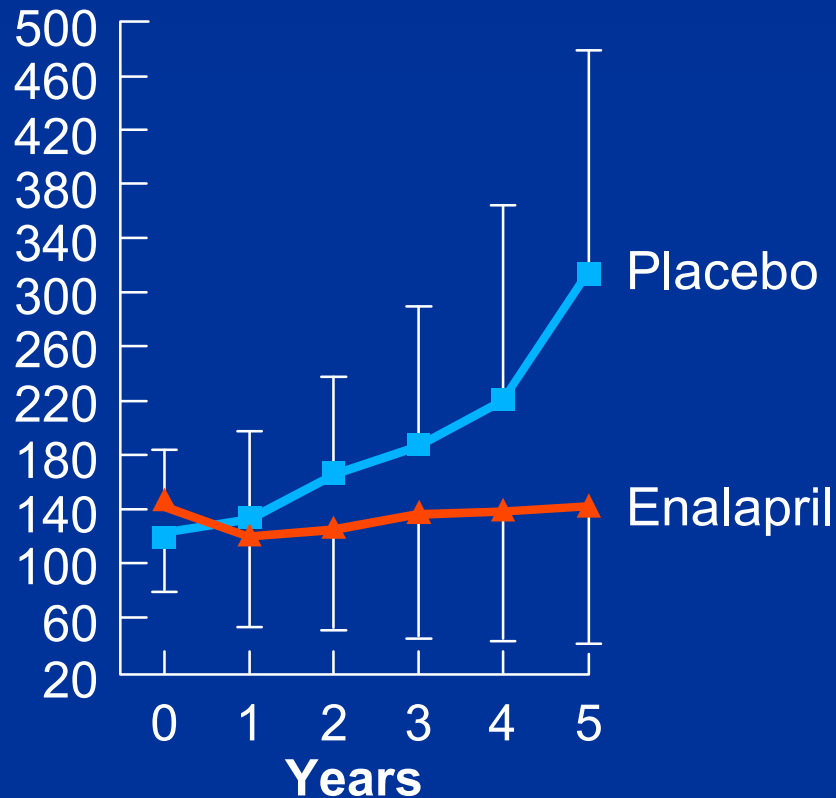
Progression of Untreated Diabetic Nephropathy

Blood Pressure 100/80 140/90 180/100

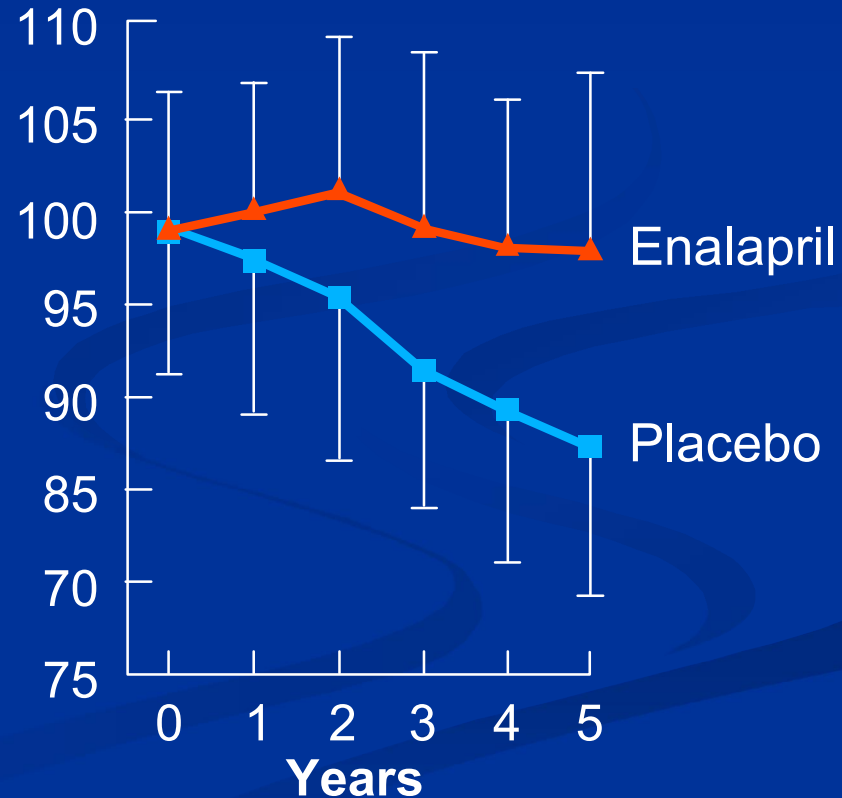


Effect of ACEI on Proteinuria and Serum Creatinine

Proteinuria
(mg/24 h)



% of
initial value
of 100/Cr



Ophthalmologic Exam

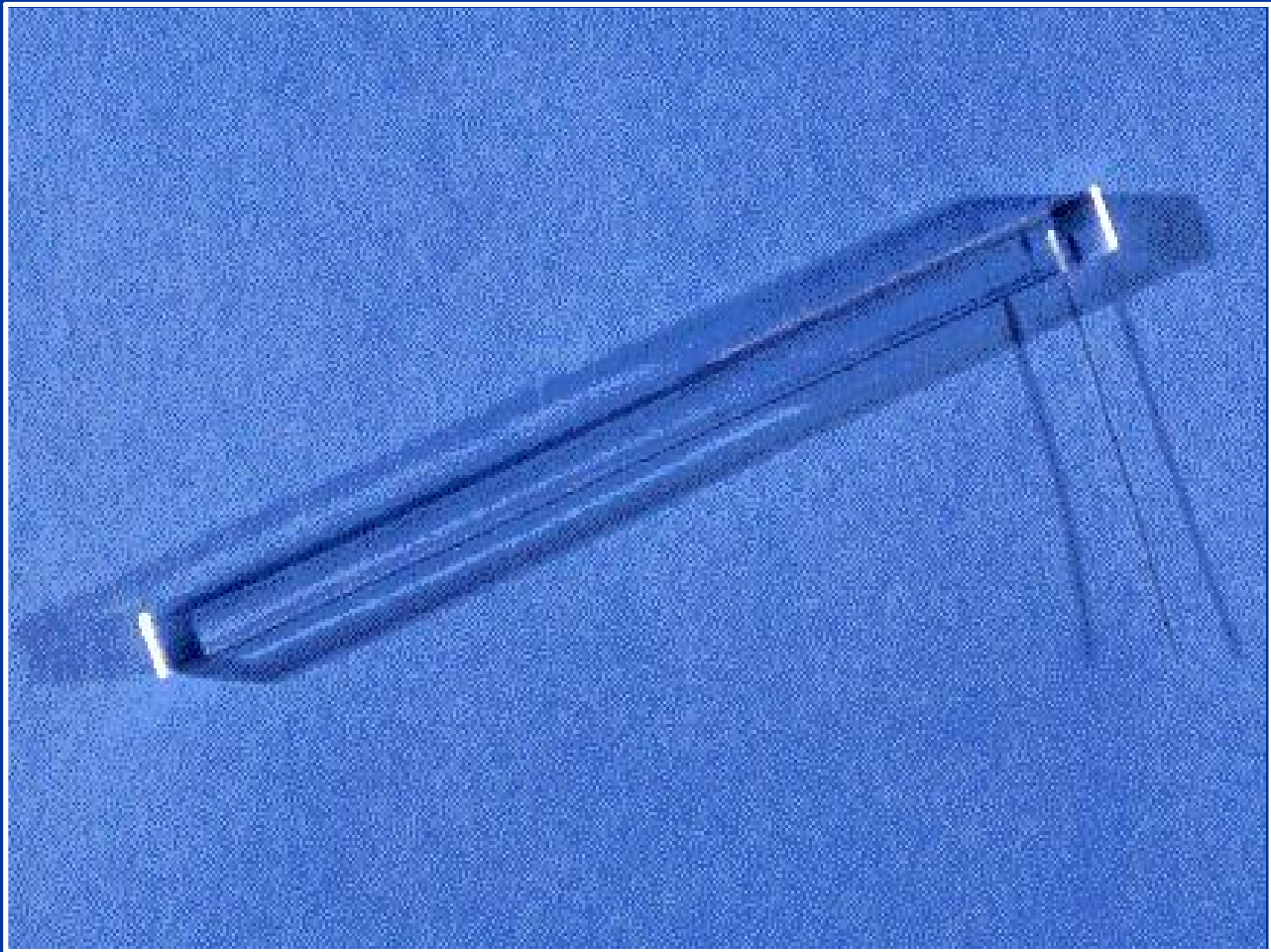
<u>Patient group</u>	<u>Recommended first exam</u>	<u>Follow-up</u>
Type1	within 3-5 yrs after diag. once patient is 10yrs or >	Yearly
Type2	time of diag.	Yearly
Preg. In preexisting diabetes	during first trimester	

Prevention of Neuropathy and Amputation

- Glycemic control
- Foot examination
 - Deformity
 - Vibratory sensation
 - Ankle jerks
 - Pressure sensation with standard nylon filament
- Immediate and thorough attention to any foot trauma or "superficial" infection
- Corrective shoes and surgery
- Teach patient daily self-examination of feet

The Diabetic Foot

- Vascular vs. neuropathic foot ulcers
- Supine and dependent pedal pulses important
- Patients should examine feet frequently
- Gross observation for deformity
- Detect insensate foot



II. Continuing Care

- Review every 3-6 months*
- Assess progress in achieving treatment goals
 - Symptoms
 - Weight goals
 - Glycemic, lipid, and blood pressure goals
- Assess complications
 - Microvascular
 - Retinopathy (as assessed by qualified eye care provider at diagnosis and yearly thereafter)
 - Nephropathy
 - Neuropathy
 - Foot care
 - Macrovascular

*Frequency will depend on whether patient is meeting goals of therapy

Recommendations for Adults with Diabetes Mellitus

Glycemic control

HbA1c	< 7%
Preprandial blood glucose	80-120mg/dl
Bedtime blood glucose	90-130mg/dl

Blood pressure

< 130/80mmHg

Lipids

LDL	<100mg/dl
Triglycerides	<150mg/dl
HDL	> 40mg/dl

Key Tests / Exams

Glycated hemoglobin-Quarterly if Rx change
At least 2x's/yr if stable

Dilated eye exam -Yearly

Comprehensive foot exam -Yearly(at risk often)

Lipid profile -Yearly

Microalbumin -Yearly

Blood pressure -Each visit

Weight -Each visit

Self Management

- What is self management?
- What forums do we have to teach self management?
- Who should be involved?
- Who can set self management goals?
- How are they tracked?

Diabetes at CHC

- 1500 DM patients in past 6 mo.
- DEMS program used at 4 sites
- RWJ Self Management program
 - Part time CDE in 4 sites
- Participation in BPH collaborative
- Peer review on DM outcomes

Diabetes in Middletown

- 212 patients seen in past 6 mo.
- 222 in DEMS
- Avg. HbA1C: 9.2
- LDL < 100 26%
- SM goal set: 16%
- %BP < 130/80: 66%

Key Measures

- Key measures are the quality measures tracked and reported on quarterly
- Based on ADA standards of care
- Mix of process and outcome measures
- DM key measure report issued by provider each quarter

Key Measures

- # patients in DEMS
- Avg. HbA1C
- %BP<130/80
- %LDL<100
- % with SM goal
- % with foot exam
- #% pts. with 2 A1C/yr
- % on ASA
- % on ACE/ARB
- % with eye exam
- % dental exam

The Diabetes Team

Patient

PCP

CDE

Nurses

MA's

Family

Podiatrist

Ophthalmologist

Dentist

Wendy Madore